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Glycemic Index (GI) Score for the USANA Oatmeal Raisin Nutrition Bar

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Background

The Glycemic Index (GI) was developed to rank different foods according to the extent to which they increase blood glucose following ingestion (1). Foods that are assigned a higher GI score generally contain higher levels of rapidly digested carbohydrates and produce a larger rise and fall in blood glucose. Foods with a lower GI score generally contain lower levels of carbohydrates and / or carbohydrates that are digested more slowly and produce a more gradual and relatively lower rise in blood glucose. GI scores are now being used in scientific research to examine the role of glycemic stress in defining the risk of certain diseases. A growing body of research has shown that long-term consumption of high glycemic diets increases the risk of developing diabetes, heart disease and colon cancer (2, 3). GI scores are also useful in designing weight management programs (2, 4, 5, 6).

The objective of this study was to evaluate the GI score for USANA's Oatmeal Raisin Nutrition Bar.

Methods

This study was conducted using an internationally recognized methodology for measuring Glycemic Index (9). Ten healthy subjects were recruited. Each completed three test sessions—two involving the reference food (glucose solution) and one involving the test food (USANA's Oatmeal Raisin Nutrition Bar). At each session, subjects reported to USANA's research center in the morning after completing a 10–12-hr overnight fast. Subjects completed a baseline fasting blood glucose, measured on the

One Touch Ultra® Blood Glucose Meter (Johnson and Johnson), using blood obtained from a finger puncture. Subjects then consumed a fixed amount of the test food or the reference food. In each case, the test and reference foods supplied 50 g of available (digestible) carbohydrate (while total carbohydrate varied). Nutritional characteristics for the servings of reference and test food are given in Table 1. Subjects were then required to remain seated and refrain from additional eating and drinking for the next two hours. Additional blood glucose measurements were taken 15, 30, 45, 60, 90 and 120 minutes after the test meal. Results were used to plot 2-hr blood glucose response curves, and the Area Under the Curve (AUC) for each plot was calculated. (AUC indicates the magnitude of the total blood glucose response.) The GI score for the test food was calculated by dividing the appropriate 2-hr blood glucose AUC value by the subject's average 2-hr blood glucose AUC value for the reference food (glucose solution) and multiplying by 100 to obtain a percentage score.

Table 1. Characteristics of the test foods.

| Food | Energy (Kj) | Protein (g) | Fat (g) | Total Carb (g) |
|------------------------------|-------------|-------------|---------|----------------|
| Glucose Reference | 800 | 0.0 | 0.0 | 50 |
| Oatmeal Raisin Nutrition Bar | 1400 | 17.6 | 5.3 | 56.4 |

Results

Figure 1 shows the average two-hour blood glucose response curves for the 10 subjects following consumption of the reference and test food. The USANA Oatmeal Raisin Nutrition Bar produced lower blood glucose levels than did the glucose reference meal. AUC analysis

based on the glucose response curves (Figure 2) yielded a Glycemic Index score of 34 for the Oatmeal Raisin Nutrition Bar (relative to the standard GI score of 100 for the glucose solution).

Discussion

The Glycemic Index scale (0-100%) is continuous. Nevertheless, a food is considered high glycemic if its GI score is greater than 70, moderately glycemic if its GI score is between 55 and 70, and low glycemic if its GI score is less than 55 (7). Results from the study reported here show that USANA's Oatmeal Raisin Nutrition Bar, with a GI score of 34, is a very low glycemic food.

The low Glycemic Index score for this nutrition bar is the result of several features: First, it is a complete macronutrient formula, providing balanced amounts of carbohydrate, protein and fat. Protein and fat generally reduce the Glycemic Index of a food. Secondly, the major sources of digestible carbohydrate (e.g. maltitol and fructose) are low glycemic ingredients. Third, the Oatmeal Raisin Nutrition Bar provides a significant amount of dietary fiber (3 g per serving), and fiber is known to generally lower the Glycemic Index of a food, probably by slowing the absorption of sugars in the gut (8). It is not surprising, then, that this nutrition bar is low-glycemic.

Replacing high-glycemic snacks with USANA's Oatmeal Raisin Nutrition Bar should help people improve the glycemic characteristics of their diets.

Furthermore, over the long-term, the Oatmeal Raisin Bar, as part of a healthy, well-balanced diet, may help to reduce the negative health consequences associated with high GI diets.

Acknowledgment: This study was conducted at USANA Health Sciences, Inc. using normal, healthy volunteers, all of whom were employees of the company.

References

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Figure 1.

Two-hour blood glucose response curves for the test food (USANA Oatmeal Raisin Bar) and the reference food (glucose solution). Values are the average for 10 subjects.

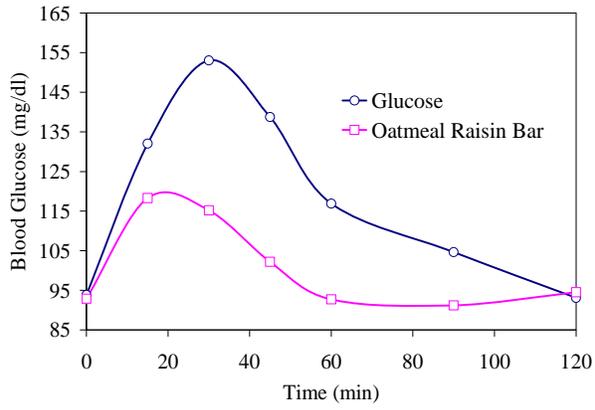


Figure 2.

Average GI scores for the USANA Oatmeal Raisin Bar versus the glucose reference food.

